

EXTERNAL STORAGE DEVICE FOR IMAGE PICKUP APPARATUS,
CONTROL METHOD THEREFOR, IMAGE PICKUP APPARATUS
AND CONTROL METHOD THEREFOR

5 BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an external
storage device for an image pickup apparatus for backup
storage of an image taken by the image pickup
10 apparatus, and also to a control method therefor, an
image pickup apparatus and an image management method.

Related Background Art

Fig. 18 is a schematic block diagram showing
the configuration of a conventional digital camera,
15 wherein a camera module 210 is composed of an image
pickup lens 212, an image pickup element 214 of CCD
type, an image pickup element control circuit 216 and
an image processing circuit 218. When an image pickup
operation mode is selected after the power supply is
20 turned on, a CPU 220 initializes the camera module 210
and renders it operable, and also activates a display
system composed of an LCD display device 222, a display
drive circuit 224, an LCD control circuit 226 and a
VRAM (video memory) 228. The LCD display device 222
25 functions as an electronic view finder and has a
display ability of 640 × 480 pixels.

The image pickup element 214 converts an

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optical image, formed by the image pickup lens 212,
into an electrical signal. The image pickup element
control circuit 216 executes noise elimination and gain
adjustment on the image signal outputted from the image
5 pickup element 212 and converts the signal into a 10-
bit digital signal for supply to the image processing
circuit 218. The image processing circuit 218 applies
processes such as white balancing, exposure adjustment,
correction for flash exposure etc. to the image data
10 from the image pickup element control circuit 216 and
converts the image data into the YCbCr format (Y:
luminance signal, Cb, Cr: color difference signals).
In case the image pickup element 214 has about two
million pixels, the image processing circuit 218 can
15 process the image data of about 1600 × 1200 pixels, but
processes the image data normally in a size of 320 ×
240 pixels and 640 × 480 pixels at largest in the stage
of displaying in the view finder.

The CPU 220 supplies the YCbCr image data from
20 the image processing circuit 218 to the LCD control
circuit 226 by DMA (direct memory access) method in a
display size of 320 × 240 pixels. The LCD control
circuit 226 once stores the YCbCr image data from the
CPU 220 into the VRAM 228 after conversion into the RGB
25 format, and then reads the image data from the VRAM 228
for supply to the display control circuit 224, which
drives the LCD display device 222 according to the RGB

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data from the LCD control circuit 226. In this state, a monitor image (object image) of 320×240 pixels is displayed in an arbitrary portion in the image area of 640×480 pixels of the LCD display device 222.

5 By executing the process from the readout of the image pickup element 212 to the display on the LCD display device 222 in continuous manner with a cycle time of $1/30$ seconds, an object image corresponding to the optical image entering the image pickup element 212
10 is constantly displayed on the image area of the LCD display device 222.

In case of taking an image, the user switches the apparatus to an image pickup mode. When a shutter switch 230 is depressed, the CPU 220 locks the set
15 values of the white balancing, exposure adjustment, correction for flash photographing etc. in the image processing circuit 218, and terminates the function of the LCD control circuit 226, the display drive circuit 224 and the LCD display device 222 in order to
20 alleviate the load of the CPU 220.

In a view finder process, there is processed only a part of the image data of the image pickup element 212 in order to increase the processing speed, but the entire image data of 1600×1200 pixels are
25 processed in the image pickup mode. More specifically, the image processing circuit 218 applies the aforementioned process to the image data of all the